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Description

Teaching Circumference Instrument

BACKGROUND OF INVENTION

[0001] 1) Field of the invention.

[0002] The invention relates to devices, which provides a teaching method for geometric concepts relating to the circumference of a circle and for determining the value of the constant π(3.14). Across the nation, schools are going through a major reform in their math and science curriculum to bring education standards up to par. The facts show that there is an achievement gap between blacks and whites in mathematics and science. In 1999, when the latest National Assessment of Education Progress (NAEP) test was administered, large differences remained between average scores for blacks and Hispanics on the one hand, versus whites and Asians on the other. Nationally, the achievement gap did not narrow at all during the 1990s. In reading and math, gaps separating poor and minority students from others actually widened at most

grade levels and remained the same or dropped only slightly at others (The Education Trust). By the end of grade 4, African American, Latino and poor students of all races are already about two years behind other students. By the time they reach grade 8, they are about three years behind. By the time they reach grade 12, if they do so at all, minority students are about four years behind other young people. The mathematics and science skills of 17-year-old African American and Latino students are similar to those of 13-year-old white students. African Americans and Latinos obtain college degrees at only half the rate of white students. The partnerships between government agency, industry, academia and private organizations are trying to address these issues along with many others. This invention provides a method for teaching the geometric concepts of a circle.

[0003] 2) Prior Art The prior art consists of teaching the theory and equations for the geometry of a circle. Lessons primarily consist of a mathematical explanation for the circumference of a circle showing that $C = \pi D$ or $C = 2\pi r$. Demonstrations might include using a string or wire and placing it around the circumference of a circle. And then measure the length of the diameter and multiply it by

3.14 showing that it is about the same length as the string or wire. The present invention, as distinguished from the prior art, provides a device that clearly demonstrates that 3.14 diameter of a circle will fit around the circumference of that circle and that 6.28 radius of a circle will fit around the circumference of that circle. None of the prior art uses a device or tool that provides a circular ring, along with diameter bars or radius bars that will fit around the circumference showing the relationship of π and the diameter, or π and the radius to the circumference of the circle.

SUMMARY OF INVENTION

[0004] The present invention is designed to teach the relationship between a circle, its diameter and its radius.

[0005] One of the objectives of the present inventions is to provide a device that will bring the level of learning and understanding of the circumference of a circle to a conceptual level rather than just a fact remembering level as described in the Blooms Taxonomy.

[0006] Another objective is to clearly show that it takes 3.14 diameters to fit around the circumference of a circle by directly placing 3.14 diameter around the circumference.

[0007] Another objective is to clearly show that it takes 6.28 ra-

dius to fit around the circumference of a circle by directly placing 6.28 radius around the circumference.

[0008] Another objective is to clearly show that it takes 3.14 radius to fit half way around the circumference of a circle by directly placing 3.14 radius around half of the circumference.

[0009] Another objective is to show why π is approximately equal to 3.14.

[0010] Another objective is to clearly show that when unit diameters are placed around the circumference, the resulting angles between each diameter will be at approximately 0, 114.6, 229.2 and 343.8 degrees.

[0011] Another objective is to clearly show that when unit radius are placed around the circumference, the resulting angles between each radius will be at approximately 0, 57.3, 114.6, 171.9, 229.2, 286.5, and 343.8 degrees.

Brief Description of Drawings

[0012] Fig. 1 is a plan view of the invention with a full-length diameter bar and a .14 length diameter bar. Attachment pins (or any mechanism used for attachment) are located on the outer perimeter of the circle located at diameter lengths of the circle at 0, 114.6, 229.2 and 343.8 degrees.

[0013] Fig. 2 is a top view of the invention. Attachment pins are located at 0, 114.6, 229.2 and 343.8 degrees.

[0014] Fig. 3 is a plan view of the invention with a full-length radius bar, a .28 length radius bar and a .14 length radius bar. Attachment pins on the outer perimeter of the circle located at radius length of the circle at 0, 57.3, 114.6, 171.9, 229.2, 286.5, and 343.8 degrees.

[0015] Fig. 4 is a top view of the invention. Attachment pins are located at 0, 57.3, 114.6, 171.9, 229.2, 286.5, and 343.8 degrees.

DETAILED DESCRIPTION

[0016] The present invention relates to a device designed to teach the relationship between a circle, its diameter and its radius.

[0017] Referring to Fig 1, the device includes a circular ring that has a rigid intersecting bar representing its diameter. The intersecting bar has marked off units dividing the bar into segments. The ring also has marked off units around the 360 degrees of the circle. Attachment pins (or any mechanism used for attachment) are located on the outer perimeter of the ring located at diameter lengths of the circle at 0, 114.6, 229.2 and 343.8 degrees. Flexible bars, the same size as the diameter, are available to attach to

the outer perimeter by way of the attachment pins. An additional flexible bar is available at .14 diameters in length. When the flexible diameter bars are attached to the circular ring, three diameters bars and one .14 diameter bar are affixed to the ring representing 3.14 diameters.

[0018] Referring to Fig 3, the circular ring now has a rigid intersecting bar representing its diameter and showing the radius of the circle. The intersecting bar has marked off units dividing the radius into segments. The ring now has attachment pins on the outer perimeter of the ring located at radius length of the circle at 0, 57.3, 114.6, 171.9, 229.2, 286.5, and 343.8 degrees. Flexible bars the same size as the radius are available to attach to the outer perimeter by way of the attachment pins. An additional flexible bar is available at .28 radiuses in length. When the flexible radius bars are attached to the circular ring, six radius bars and one .28 radius bar are affixed to the ring representing 6.28 radius.

[0019] Another additional flexible bar is available at .14 radiuses in length. When the flexible radius bars are attached to half of the circular ring, three radius bars and one .14 radius bar are affixed to the ring representing 3.14 radius.

[0020] Classroom activities can be developed using the present

invention that will increase the level of understanding of the circumference of a circle and the value of π (3.14). By attaching three diameter bars and one .14 diameter bar around the circumference of the ring, students can immediately see and understand the equation, circumference = 3.14 diameters (C = πD). And it becomes clear why π = 3.14.

[0021] By attaching six radius bars and one .28 radius bar around the circumference of the ring, students can immediately see and understand the equation, circumference = 6.28 radius. Or written another way, circumference = 2 x 3.14 radius (C = 2 πr).

[0022] By attaching three radius bars and one .14 radius bar around half of the ring, students can immediately see and understand that half of the circumference = 3.14 radius (1/2 x C = πr).

[0023] Participating in these activities brings the level of learning and understanding of the circumference of a circle to a conceptual level rather than just a fact remembering level as described in the Blooms Taxonomy.